Mischocarpus ailae Guymer (Sapindaceae), a new species from the Mount Warning caldera, Australia

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Summary

Guymer, G.P. (2009). *Mischocarpus ailae* Guymer (Sapindaceae), a new species from the Mount Warning caldera, Australia. ***Austrobaileya* 8(1): 91–95**. *Mischocarpus ailae* from south-east Queensland and north-east New South Wales is described as new with notes on its distribution, habitat and conservation status. A key to the Australia species of *Mischocarpus* is provided.

Key Words: Sapindaceae, *Mischocarpus*, *Mischocarpus ailae*, *Mischocarpus lachnocarpus*, taxonomy, Australian flora, Queensland flora, new species, identification key

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Introduction

The genus *Mischocarpus* Blume (tribe *Cupanieae* Blume, family Sapindaceae) has 20 species and is distributed throughout Asia, from India and China to Melanesia and eastern Australia (Van der Ham 1977; Reynolds 1985a, 1985b). Australia has 11 species (10 endemic) that occur from Cape York, Queensland to the central coast of New South Wales. A critical examination of *Mischocarpus* specimens at the Queensland Herbarium has revealed that the southern populations previously referred to *M. lachnocarpus* (F.Muell.) Radlk. in south-east Queensland and north-east New South Wales represent a quite distinct new species and it is formally described here.

Material and methods

The information presented in this paper is based on examination of herbarium collections at the Queensland Herbarium (BRI) and National Herbarium of New South Wales (NSW) and observations of plants in the field. The descriptions are modelled on those of Reynolds (1985a, 1985b).

Taxonomy

Mischocarpus ailae Guymer, **species nova** differt a *Mischocarpo lachnocarpo* capsulis majoribus luteis globularibus (14–18 mm longis), arillo luteo aurantiacove, praesentia petalorum et filamentis pilosis.

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Typus: New South Wales. North Coast: Mt Warning, 8 March 2009, *D.A.Halford Q9671 & G.P.Guymer* (holo: BRI; iso: BRI, K, L, MEL, NSW).

Mischocarpus lachnocarpus auct. non F.Muell., Floyd (1977, 1989, 2008); Van der Ham (1977, [south east Queensland and New South Wales specimens]); Reynolds (1983 [excluding the illustration], 1985a & 1985b, [Springbrook Plateau & New South Wales specimens, & illustrations]); Harden (1991, [excluding the illustration of the capsule]); Logan River Branch SGAP (2005); Leiper *et al.* (2008).

***Illustrations*:** Reynolds (1985a, p. 99, fig. 21A, B; 1985b, p. 172, fig. 3I, all as *M. lachnocarpus*); Logan River Branch SGAP (2005); Leiper *et al.* (2008).

Small trees 3–10 m high, stems up to 10 cm diameter at breast height with smooth grey or brown bark; young growth, branchlets, leaf-axes and inflorescences densely ferruginous villous with simple erect hairs 0.1–0.6 mm long; branchlets striate. Leaves with 2 (3 or 4) leaflets; leaflets opposite, coriaceous, elliptic or oblong-ovate, 5.5–13 × 2–5 cm (length: width ratio 3:1 to 2:1), slightly shiny, dark green above, paler below, slightly bullate, glabrous except for puberulent midrib and sometimes lateral veins above, pubescent below, dense along the midrib and lateral veins, mid-dense to sparse elsewhere, hairs simple up to 0.2 mm long (up to 0.5 mm along

midrib), margins recurved, apices obtuse or retuse, with small umbo < 0.5 mm long, bases obtuse or rounded, midrib sunken in a narrow groove above, prominently raised below; lateral veins 10–14 pairs, slender, patent, looping inside margins, slightly raised above, raised below; reticulation minute, prominent and slightly raised above and below; domatia present as small pockets or flaps at most lateral vein-midrib junctions below (occasionally at sublateral veins), 18–30 per leaflet, up to 0.5 mm long; petiolules pulvinate, 3–10 mm long, pubescent, channelled above; petioles slightly pulvinate, 10–36 mm long, pubescent, striate. Panicles axillary, in upper leaf axils, 1.5–7.5 cm long, axes and bracts ferruginous villous; bracts narrowly triangular, 0.5–2.5 × 0.2–0.7 mm. Flowers white, 3–3.5 mm diameter; pedicels 1–2 mm long, pubescent, articulate at the base; calyx 5-lobed to near the base, lobes triangular to ovate, 1–1.2 × 0.7–0.8 mm, pubescent outside, ± glabrous inside, persistent; petals present, 4 or 5, rhombic, with rounded or obtuse apices, 1–1.3 mm long, sparsely pubescent outside, ± glabrous inside, claw 0.5–0.6 × 0.2–0.3 mm, scales 2, villous; disc annular, glabrous or with sparse hairs above. Male flowers: stamens 8 or 9, filaments 1.5–1.7 mm long, villous; anthers 0.7–0.8 × *c.* 0.5 mm, sparsely puberulent; ovary rudimentary, *c.* 0.5 mm long, villous. Female flowers: stigmas 3, recurved, papillose, remainder not seen. Capsules globular or subglobular, occasionally 2-lobed, 13–15 mm diameter, 14–18 mm long, with a brown pubescence of simple erect hairs 0.2–0.8 mm long outside, on stipes 5–6 mm long, 3–4 mm diameter, apiculate with remnants of style and stigmas to 2 mm long, yellow; loculicidally or septically dehiscent, valves drying crustaceous, glabrous or with an occasional hair along the sutures inside; seeds covered or almost so in a yellow or yellow-orange aril, aril connector folded lengthwise, 3–5 mm long extending to 12 mm and allowing the seed to hang down beyond the capsule. Seeds 1 or 2, shiny, globular or semi-spheroid with one flat side in 2-seeded capsules, 10–13 × 10–14.5 mm, dark brown. Germination cryptocotylar. First seedling leaves subopposite, oblong-ovate, 2.5–4.5 × 2–2.7 cm, sparsely puberulent; petioles 1–2 mm long. **Fig. 1.**

***Additional specimens examined*: Queensland**. Moreton District: near Lyrebird Ridge Road, Springbrook, Dec 1990, *Bird s.n.* (BRI [AQ502591]); Repeater Station Road, Springbrook, Dec 1993, *Bean 7185* (BRI); Springbrook Lookout, MacPherson Range, Dec 1915, *White s.n.* (BRI [AQ118673]); between portions 150 & 94 Numinbah, NW of Hardys Falls, W side of Springbrook Plateau, Mar 1979, *McDonald 2821* (BRI); Canyon Circuit Track, near Ngarri-dhum Falls, Warrie National Park, Springbrook, Jun 1978, *McDonald 2071* (BRI). **New South Wales**. North Coast: Mt Warning, Jul 1965, *Hayes s.n.* (BRI [AQ118670]); Mt Warning, Mar 2009, *Halford Q9670 & Guymer* (BRI, NSW); walking track to Mt Matheson, Nightcap National Park, Mar 2009, *Halford Q9673 & Guymer* (BRI, NSW).

***Distribution and habitat*:** *Mischocarpus ailae* is known from the Mount Warning (Wollumbin) caldera, ranging from the Springbrook plateau, south-east Queensland to Mt Matheson, and also on Mt Warning, north-east New South Wales. It occurs in complex or simple notophyll vine forest (Regional Ecosystems 12.8.3, 12.8.5 and 12.11.1) on basalt, rhyolite or metasediments between 950 to 700 m altitude (to 100 m altitude if localities of Floyd below are confirmed).

W.J.F. McDonald, Queensland Herbarium (*pers. comm.* 2009) has recorded this species in SE Queensland from Upper Mudgeeraba Creek, near Mt Gannon, Fairview Mountain (Springbrook N.P.) and Cave Creek, Numinbah Valley. Floyd (1977, 1989, 2008) records this species from Mount Nardi, Boomerang Falls, Billinudgel, Huonbrook and Upper Crystal Creek, and the following Nature Reserves: Andrew Johnson Big Scrub, Goonengerry, Inner Pocket, Mooball and Numinbah in New South Wales. No specimens have been seen from these localities.

***Phenology*:** The species flowers from November to January and fruits from February to April, or in July.

***Affinities*:** *Mischocarpus ailae* has been confused with *M. lachnocarpus* in the past as both species have similar leaves. However, *M. ailae* is readily distinguished from *M. lachnocarpus* by its flowers with 4 or 5 petals (*cf.* absent), its villous filaments (*cf.* glabrous), and capsules that are yellow (*cf.* red or orange-red), globular or subglobular (*cf.* trigonous), larger (13–15 mm diameter *cf.* 5–8.5 mm diameter) and glabrous inside (*cf.* hairy along sutures inside), and its seeds with a yellow or orange aril (*cf.* purple or blue aril).

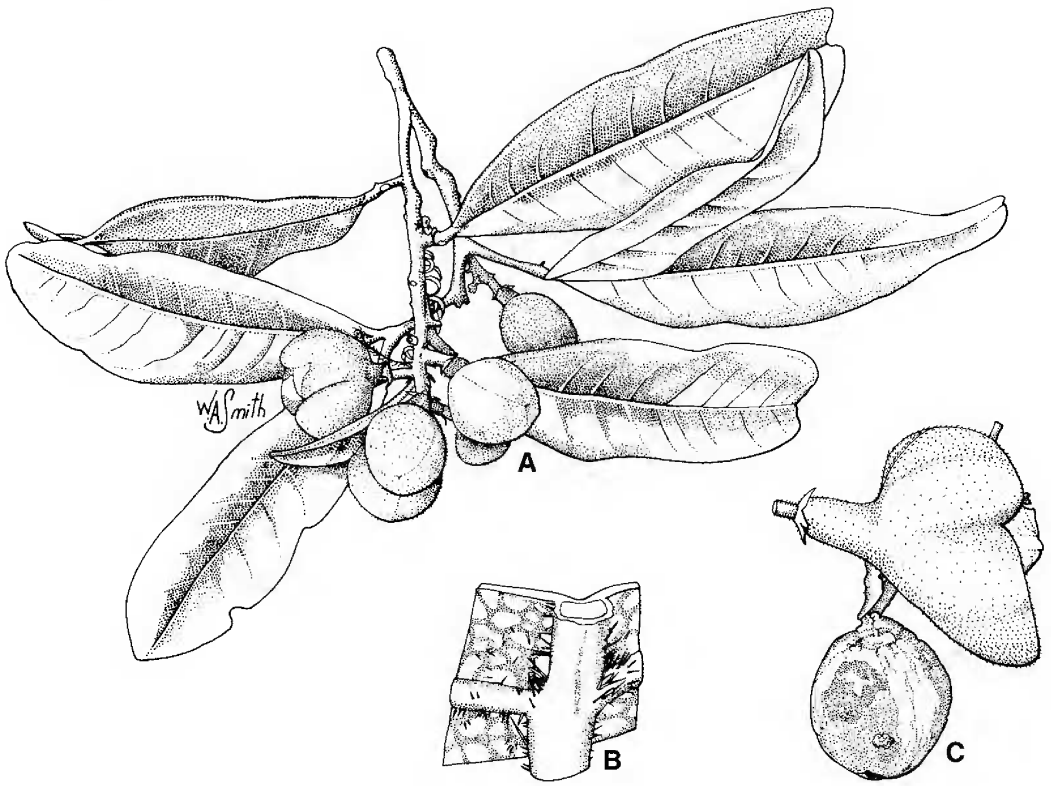

Fig. 1. ***Mischocarpus ailae***. A. fruiting branchlet × 0.8. B. dehiscing capsule with seed × 1.5. C. domatia on lower leaf surface × 10. All from *Halford Q9671 & Guymer* (BRI). Del. W. Smith.

Mischocarpus ailae is not closely allied to any other species within the genus. However, the yellow capsules, orange or yellow aril, presence of petals and pilose filaments indicate some affinity to *M. exangulatus* (F.Muell.) Radlk.

***Notes*:** The species was first collected by C.T.White from Springbrook in 1915 and it was identified as possibly *Ratonia lachnocarpa* (= *Mischocarpus lachnocarpus*). Van der Ham (1977) identified this collection and Hayes' from Mount Warning as *M. lachnocarpus* and believed that the flowers of the two collections were abnormal as "they consist of several whorls of bracteole-like, sepaloid, and petaloid scales between which no distinct limits can be drawn ....a disk is hardly present". Recent flowering collections show the sepals and petals are normally developed as is the disk.

Reynolds (1985a, 1985b) description of *M. lachnocarpus* capsules included those of *M. ailae* (based on *McDonald 2821*) and so an amended description of the capsules of this species follows. *Mischocarpus lachnocarpus* has capsules that are red or red-orange, trigonous, 5–8.5 mm diameter, with dense brown pubescence outside of simple erect hairs 0.4–1.2 mm long, on stipes 4–7 mm long and 1.4–1.6 mm in diameter, apiculate with remnants of style and stigmas 1–1.5 mm long; loculicidally dehiscent, valves drying crustaceous and golden-brown villous inside along sutures, and the seeds covered or almost so in a blue or purple aril (see Williams (1984, p. 203), Nicholson (1994, p. 47) and Cooper & Cooper (1994, p. 193; 2004, p. 497) for coloured illustrations).

***Conservation status*:** *Mischocarpus ailae* has a restricted area of occurrence of about 750 km^2 within the Mt Warning caldera. Its

natural extent most likely declined early last century when the Springbrook Plateau was cleared of vegetation. However, existing populations of it are conserved in National Parks (Springbrook and Nightcap) and Nature Reserves, and it is not threatened at this time.

***Etymology*:** The species is named for Dr Aila Keto (1943-), founder and President of the *Australian Rainforest Conservation Society*, who has made major contributions to the conservation of Australia's rainforests and their World Heritage listing.

***Common name*:** woolly brush apple (Floyd 1977). Harden (1991) gives the common name as woolly pear-fruit but this applies to *Mischocarpus lachnocarpus*.

Key to *Mischocarpus* species in Australia

1 Domatia present, as domes, pockets or small pits along the midrib of the leaflets below 2
1. Domatia absent 9

2 Leaves with 6–12 leaflets, white and papillose below together with appressed fine simple brown hairs, usually with a solitary dome domatium near the base. NE Qld . . . . . **M. albescens**
2. Leaves with 2–6 leaflets; leaflets green or pale green below (not papillose), with cavity, pit or 1 or more dome domatia. 3

3 Domatia as conspicuous raised pockets or domes 4
3. Domatia as small pits or pockets (not raised) 6

4 Leaflets 2–6, obovate-oblong, elliptic or ovate, 3.5–11.5 × 1.5–6.5 cm; domatia 1–7 per leaflet, raised domes near base of leaflet below 5
4. Leaflets 5–8, elliptic to ovate, 5–18 × 1.5–8 cm; domatia 5–16 per leaflet, raised pockets along midrib below. McIlwraith Ra. to Paluma, N Qld . . . . . **M. exangulatus**

5 Leaflets 2–4, domatia 1 or 2 at base of each leaflet; petals absent; filaments glabrous; capsules villous inside; aril purple. Daintree, NE Qld to Richmond River, NSW . . . . . **M. anodontus**
5. Leaflets 2–6, domatia 1–7 per leaflet; petals present; filaments villous; capsules glabrous inside, aril orange. Thornton Peak to Mt Bartle Frere, above 950 m altitude, NE Qld . . . . . **M. montanus**

6 Leaflets pubescent below; domatia 10–30 per leaflet as small concealed pockets along midrib at most lateral veins 7
6. Leaflets glabrous below; domatia 4–20 per leaflet, visible with a hand lens as small pits *c.* 0.5 mm diameter 8

7 Flowers with petals; stamens with pilose filaments; capsules globular or subglobular, yellow, 13–15 mm diameter on stipes 5–6 mm long, glabrous inside; seeds with yellow or yellow-orange aril. Mt Warning caldera: Springbrook, SE Qld to Mt Matheson, NE New South Wales . . . . . **M. ailae**
7. Flowers without petals; stamens with glabrous filaments; capsules trigonous, red or red-orange, 5–8.5 mm diameter on stipes 4–7 mm long, villous inside; seeds with blue or purple aril. Bamaga to Paluma, NE Qld & New Guinea . . . . . **M. lachnocarpus**

8 Leaflets 4–6, vernicose above; capsules on stipes 10–22 mm long, sparsely villous inside, septa glabrous. Cape York to Eungella, Qld . . . . . **M. stipitatus**
8. Leaflets 2–4, shiny above; capsules on stipes 3–6 mm long, densely villous inside including septa. Gympie, SE Qld to Williams River, NSW . . . . . **M. australis**

9 Leaves with 8–10 leaflets, 22–50 × 8–20 cm; leaf rachis 13–60 cm long. Wet Tropics, NE Qld . . . . . **M. grandissimus**
9. Leaves with 4–8 leaflets 4–18 × 1–8 cm; leaf rachis less than 12 cm long. 10

10 Petals present; stamens with pilose filaments; leaflets with indistinct lateral veins; aril orange or red. Wet Tropics NE Qld to NE NSW . . . . . **M. pyriformis**
10. Petals absent; stamens with glabrous filaments; leaflets with conspicuous lateral veins; aril blue or purple. 11

11 Capsules subglobose 6–10 mm diameter on stipes 9–12 mm long; valves sparsely appressed villous inside; leaflets glossy or vernicose above; aril partly enclosing the seed, pale purple or blue. Cape York to Eungella, Qld. . . . . **M. stipitatus**
11. Capsules trigonous, obovoid, 12–14 mm diameter on stipes 9–13 mm long; valves glabrous inside; leaflets matt or slightly shiny above; aril completely enclosing the seed, dark purple or blue. Atherton to Eungella, Qld . . . . . **M. macrocarpus**

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